fection is not likely, even if the instruments are not thoroughly sterile. The same results are found in general paralysis.

J. Sailer (Philadelphia.)

BRAIN

(Vol. 26, 1903, No. 4, Winter.)

1. Case of Progressive Muscular Atrophy of Spinal Origin in a Girl Aged Eleven Years: with Autopsy. Herbert, Morley, Fletcher and Frederick E. Batten.
2. Beri-Beri in Monkeys. Hamilton Wright and M. D. McGill.
3. Associated Movements in Hemiplegia: Their Origin and Physiological Significance. H. Campbell Thompson and F. R. C. P. Lond.
4. Experimental Research on the Course of the Optic Fibers. George Dean and C. H. Usher.
5. Post-diphtheretic Chronic Bulbar Paralysis and Its Distinction from Myasthenia. Wilfred Harris.
6. Degeneration Resulting from Lesions of Posterior Nerve Roots and from Transverse Lesions of the Spinal Cord in Man. A Study of Twenty Cases. James Collier and E. Farquhar Buzzard.

1. *Progressive Muscular Atrophy.*—The authors contribute the history and pathological findings of a case of progressive muscular atrophy of spinal origin occurring in a child. M. L., eleven years. Twelve months weakness of hands; seven months unable to button clothes; four months weakness of legs; two months adenoids removed, and much worse since that operation; fourteen days pain in back and increased difficulty in swallowing: intelligent, deaf, some atrophy of tongue, palate moves well on phonation, weakness of neck, respiration thoracic, upper intercostals only in use; claw hand, wrist drop, weakness of upper arm and shoulder muscles; can walk but only feebly, knee-jerks brisk, plantars flexor, sensation natural to all forms; electrical reaction R. D. in some muscles, in others only diminution of irritability. Sudden death from respiratory failure six months later.

The pathology of the condition was extremely intricate. By the Marchi method degeneration was discovered commencing about the twelfth thoracic segment, increasing with the eighth and seventh, and reaching its maximum intensity at the sixth, the gray matter being hard to distinguish from the surrounding white matter. The fibers occupied the region of the cord all round the gray matter of the anterior horns and somewhat the antero-lateral tracts. Other studies by the Nissl and Weigert methods were made. The authors summarize their findings as follows: (1) There was extensive destruction and atrophy of the cells of the anterior horn from the upper cervical to the lower thoracic segments, this change being most marked at the level of the sixth thoracic segment. The cells of Clarke's column were also affected. (2) There was extensive degeneration of the whole of the ventral region of the cord in the thoracic segments, the lesion being most marked at the level of the sixth thoracic segment, and diminishing in extent both toward the medulla and caudally. There was extensive degeneration in the direct cerebellar tracts, both dorsal and ventral, beginning in the lower thoracic segments and extending up to their respective terminations in the cerebellum. The degeneration affected both gray and white matter alike in that region of the cord which was most affected, viz.: the thoracic segments. (3) There was a marked increase of the connective tissue in the ventral portion of the cord in the thoracic region (4) The walls of the vessels showed no change; there was engorgement of vessels with extravasation of blood into the perivascular spaces. (5) The cord showed both recent and old degeneration.

2. *Beri-Beri in Monkeys.*—The authors conclude from their studies that beri-beri is present in monkeys as well as in man, and summarize as

follows: The onset, early and developed symptoms, the underlying lesion in the stomach, duodenum and nervous system, the condition under which the disease was contracted, are so similar to what has been found in man that there can be no hesitation in concluding that all these monkeys contracted beri-beri. Case 3 alone would not have warranted such a conclusion, not because the animal had become septic, but because it had become so grossly septic. It would not be urged that beri-beri in man was not beri-beri, because a few days before sepsis had occurred as the result of infection through bed or other sores, or because of death being due to some intercurrent disease, such as phthisis or dysentery. No doubt sepsis and intercurrent diseases may modify to some unrecognizable extent the characteristic lesion of beri-beri in the peripheral and central nervous system, but that is all. On the other hand, there is no doubt whatever that the lesion of the nervous system in beri-beri induces disease in the lungs and other parts of the body, *e.g.*, phthisis, fatty degeneration of the heart, liver, etc. The fact, therefore, that Case 27, already published, and Case 3, included here, were septic during the few days before they were killed, does not militate against the conclusions, for the characteristic symptoms of beri-beri preceded the sepsis by weeks. Cases 27, 3 and 94 should be classified as acute, and 125 as sub-acute beri-beri, that would have recovered or have ended as residual beri-beri paralysis, had the animals not been killed during or shortly after the active stage of infection had ceased and the organism and its toxin eliminated. But Case 86 should be classified as acute pernicious beri-beri, in which the causal organism developed rapidly, producing so virulent a toxin that it acted widely and severely on the vital and ordinary afferent neurones, and so rendered the animal moribund in a few hours. Had it been given a chance, the authors do not think this animal would have recovered. The value of this observation lies in the fact that it conclusively proves: (a) That beri-beri is an acute infectious disease. (b) That the organism—as yet unknown—exists in close, sunless foci, *e. g.*, the cells of a jail in this instance. (c) That no food, as food, either qualitatively or quantitatively, is a factor in the production of the disease. (d) That the organism is not an organism that affects or develops on food commonly used by man. (e) That the organism is probably ingested with food accidentally contaminated by it. (f) That it multiplies in the stomach and upper part of the small gut, causing a local congestion or inflammation, and elaborates a toxin which, being absorbed, acts with varying force bilaterally and symmetrically on certain vital and ordinary neurones, to give rise to the collection of symptomes known as beri-beri. (g) That the incubation period of beri-beri is short. (h) That rice, either as a diet or as the habitat of a living specific organism, cannot for a moment be seriously considered. These conclusions were arrived at after a careful experimental study of the disease in man, and are confirmed by this observation on monkeys. It but remains to detect the organism. The authors are convinced that no good but only confusion will result if bacteriologists and other students of the subject do not firmly grasp the distinction made between beri-beri, the acute infectious disease, and its residual paralysis.

3. *Associated Movements in Hemiplegia.*—Thomson seeks to show that the involuntary associated movements seen in hemiplegia have a definite history in evolution, and were once useful for ordinary purposes of life. He goes back to the fishes and lower animals to show the origin of many of these movements, particularly demonstrating that the evidence goes to show that respiratory movements in animals were originally closely associated with movements of the limbs, and it seems likely that it is this association that accounts for the presence of commissural fibers between the nuclei which preside over the two movements. As the respiration becomes more thoracic in character its association with the legs would become weakened, and then, later on, the movement of the arms would gradually

become disassociated as they became educated to perform more special movements, for the inhibition required for these finer movements would effectually prevent any movement taking place with respiration, which, if allowed, would obviously destroy the utility of the arms for other purposes. At the same time the increasing automatic action of the respiratory movements would also tend to make ordinary respiration independent of any support from the limbs except in cases of difficulty, and thus the movements of respiration and of the limbs, at first intimately associated, would gradually drift apart until finally, with the development of inhibition on the one hand, and with the disuse of the commissural paths on the other, the association would practically disappear, but as soon as the inhibitory impulses are taken off, the limb again tends to resume its old relations, the unused paths become reopened and the old associations are revived. In health these paths have still, in this instance, been used a little during yawning, so that their obliteration has never been quite complete. Yawning is a peculiar respiratory act in many ways, and is certainly more automatic than ordinary breathing. According to Sir Michael Foster the stimulus in yawning probably acts upon the respiratory center itself; possibly the centers in the cord also take a share in it, but in any case yawning may be looked upon as a lower type of the respiratory process than ordinary respiration, and, therefore, the one with which the movement of the arms would be likely to be longest associated.

4. *Optic Fibers.*—The present communication gives the results of a number of experiments on monkeys with degeneration in the optic nerve and in the chiasm resulting from lesions of the retina or division of the nerve., The results obtained are extremely complex and do not permit of summary in this place.

5. *Diphtheritic Paralysis and Myasthenia.*—Chronic bulbar paralysis, occurring as a sequel to diphtheria, has been found by the author in only four instances. Nevertheless, he believes that very occasionally permanent palsy may result following diphtheritic paralysis. That when such permanent paralysis remains it is usually of muscles supplied by one or more of the bulbar nuclei. That a distinct type of bulbar paralysis may ensue, closely resembling in its distribution that which is familiar in myasthenia, or asthenic bulbar palsy, but which is to be distinguished from the latter by the non-variability of the symptoms, the absence of the myasthenic reaction, the absence of ptosis, or weakness of the jaw muscles or of the neck or limbs. It is further distinguished by the absence of the attacks of dyspnea, so characteristic of many cases of myasthenia, and by the presence of muscular atrophy and the reaction of degeneration.

6 *Degeneration from Lesions of the Spinal Cord.*—The authors have examined in this paper two cases of isolated lesion of the posterior roots in the cervical and lumbo-sacral regions, twelve cases of transverse lesion of the spinal cord at various levels. The paper is extremely elaborate and bountifully illustrated and should be considered in the original.

(Vol. 27, 1904, Spring.)

1. Hysteria and Neurasthenia. SEYMOUR J. SHARKEY.
2. A Case of "Subacute Combined Sclerosis," with Profound Anemia. JAMES TAYLOR.
3. The Effect of Total Transverse Lesion of the Spinal Cord in Man. JAMES COLLIER.
4. On the Primary Staining of the Rat's Brain by Methylene Blue. JOHN TURNER.
5. Note on a Case of Defective Development of the Lateral Cerebellar Lobes in a Dog. THOMAS LEWIS.
6. Unilateral Congenital Lesion of Medulla and Spinal Cord; Death from Pontine Hemorrhage. PURVES STEWART.

7. Binocular and Stereoscopic Vision in Man and Other Vertebrates, with Its Relation to the Decussation of the Optic Nerves, the Ocular Movements, and the Pupil Light Reflex. WILFRED HARRIS.

1. *Hysteria and Neurasthenia.*—In a presidential address delivered before the Neurological Society of the United Kingdom, Dr. Sharkey spoke of these two conditions. He spoke of (*a*) explosiveness, (*b*) want of control, (*c*) proneness to exhaustion, as characteristic of brain activity in hysteria, and then went over considerable old ground in delineating some of the clinical signs. If the disease, as he says, is to be looked upon as a congenital condition, one canot hope to cure it. Rest in bed, isolation of the patient, massage and tonics are all he can suggest in the way of treatment. In speaking on neurasthenia he believes that it is not impossible that a real degeneration of nerve cells takes place, and therefore the treatment requires considerable time.

2. *Subacute Combined Sclerosis.*—The history and pathological findings of a case of this disorder, occurring in a severe anemia, and similar in many respects to cases already spoken of.

3. *Transverse Lesion of the Spinal Cord in Man.*—Collier presents a paper drawn from the records of fifteen cases of transverse lesion. He defines transverse lesion as occurring when (*a*) the spinal cord is actually severed, (*b*) serial longitudinal sections, stained by appropriate methods, show no myelinated fibers, (c) transverse sections show whole areas to be necrotic. He remarks, with truth, that the size of the spinal cord in the region of the lesion is no criterion for the extent of the injury. Clinically, a physiological total transverse lesion may be considered as existing when there is absolute loss of sensibility, complete flaccid paralysis and loss of the deep reflexes. Such complete physiological abrogation of the functions may exist without the actual death of the elements involved. These elements may recover more or less completely. When there is complete degeneration of all elements of the transverse area of the spinal cord, there can be little doubt, he says, that sufficient continuity for the maintenance of the spastic state and for the return of the knee-jerks may be re-established by the regeneration of the conducting paths. With gradual lesions the order of appearance is practically as follows: Motor paralysis and spasticity, equilibratory anesthesia, sphincter paralysis, therm-anesthesia and analgesia, tactile anesthesia, flaccidity with loss of the deep reflexes, progressive muscular wasting, progressive lowering of faradic excitability, progressive loss of sphincter tone. The motor paralysis and spasticity develop slowly and with even steps. Sphincter paralysis is variable, sometimes appearing long before any skin sensory loss is apparent, sometimes long delayed until skin sensory loss is marked. Loss of skin sensibility from increasing lesion, when once apparent, progresses much more rapidly than does the motor paralysis, and it would appear that sensibility to pain and temperature is always impaired earlier and to a greater extent than is sensibility to touch. The change from the spastic state to the flaccid state takes place rapidly in from twenty-four hours to a week, according to the acuity of the lesion, and is accompanied, or shortly followed, by loss of the deep reflexes. It never occurs till the sensory loss is complete over the lower extremities. Muscular wasting, lowering of faradic excitability and loss of sphincter tone commence with the onset of the flaccid state, and are progressive as long as the physiological transverse lesion remains total. When there is recovery from the total physiological transverse lesion the first sign of such recovery is the return of the knee-jerk and a gradual change from the flaccid to the spastic state. Sensibility returns in the order, touch, pain temperature; and the lowest sacral segments usually become sentient before the others. The first sign of such return is often that the patient becomes conscious of the act of micturition, or of catheterization, or of the distention of the bladder during the routine lavage. In one case sensibility returned first in the feet.

Voluntary power returns in the flexors earlier than in the extensors, flexion of the toes being almost invariably the earliest voluntary movement possible. In cases where recovery is complete the plantar reflex does not resume the flexor type until some time after the patient has completely recovered the use of the lower limbs, the extensor response being invariably the last of all spastic signs to disappear. He then discusses in detail the condition of the distribution of the sensory loss; the evidence derived from the muscular condition, which from clinical evidence, he says, strongly supports the argument that muscular wasting, lowering of faradic excitability, and loss of deep reflexes under consideration, are the result of isolation of the lumbo-sacral region of the cord from the higher centers above. The deep reflexes are abolished below the lesion. Their partial return is evidence that the lesion has not remained total. Skin reflexes appear to be invariably abolished with the possible exception of the plantar reflex. The visceral reflexes in his series were variable, abdominal distention met with in a few cases, and edema and trophic changes were constant.

4. *Staining of Rat's Brain.*—The author gives a series of results obtained by various methods, using methylene blue as an intravitam stain. As the paper is very much detailed it should be consulted in the original.

5. *Defective Cerebellar Development.*—The author describes a typical case of circus movement in a dog in which it was shown that the abnormality was associated with destruction in the lateral lobes (and so with the pontine nuclei) alone. This case, in the author's opinion, lends weight to the view that the cerebellum may virually be regarded as a twofold organ, consisting of one part, the vermis, essentially spino-cerebellar, and another part, the lateral lobes, essentially ponto-cerebellar.

6. *Congenital Lesion of the Medulla and Spinal Cord.*—The author presents an extremely interesting case of congenital lesion. It is exceedingly complicated and studied in great detail. It should therefore be considered in the original.

7. *Binocular Vision.*—From the author's studies of many years on experimental lesions of the optic tracts, of the commissures and optic nerves in cats and dogs, etc., he draws the following conclusions: (1) The decussation of the optic nerves at the chiasma is complete in all fishes, amphibia, reptiles and birds, whether possessed of binocular vision or not. (2) Binocular vision is originally associated with carnivorous habits, and is found to a moderate degree among carnivorous fishes, in a few of the sharks and rays, in some amphibia, as the toad, which lives on flies and insects, and in many carnivorous birds, especially the larger gulls, some penguins, hawks, owls and vultures. Among mammals binocular vision is especially developed in the carnivora and in the primates. In the latter group of monkeys and man perfect binocular vision is probably associated with the development of the hand as a prehensile organ. (3) Though many of these animals have a fair binocular vision, yet in all vertebrates below mammals there is total decussation of the optic nerves at the chiasma, and their vision is, therefore, not stereoscopic in the same sense as in the higher mammals, in which visual impressions from the two eyes are received on the same side of the brain, owing to the semi-decussation of the optic nerves at the chiasma; and their macular vision is also less developed than in the higher mammals, as in the felidæ and primates. (4) In animals with laterally placed eyes and periscopic vision the movements of the eyes are independent of each other, as seen typically in the chameleon, while conjugate movements of the eyes for lateral and vertical movements are associated with the acquirement of stereoscopic vision. Convergence of the eyes in the act of feeding is seen in many animals with total decussation of the optic nerves and otherwise independent movements of the eyes, as in the chameleon and the hornbill. (5) The reflex contrac-

tion of the pupil to light is limited to the eye stimulated, and is not consensual, in amphibia and birds, whether possessed of binocular vision or not. In the rabbit, with scarcely any binocular vision, only the one pupil reacts, and the decussation is almost complete. In casts and in the higher mammals with good binocular vision and semi-decussation of the optic nerves at the chiasma there is consensual pupil reaction. Consensual pupil contraction to light is therefore dependent, not on binocular vision alone, but on semi-decussation of the optic nerves at the chiasma. (6) In the rabbit and the cat both the crossed and the uncrossed fibers are spread equally through all parts of the two tracts, and are not connected into any distinct bundle. (7) Experimental division of the optic tract on one side in cats produced distinct homonymous hemianopia, with the hemianopic pupil reaction, and with considerable diminution of the pupil reaction to direct light in the opposite eye, though its consensual reaction was brisk on exposure of the other eye to light. (8) Injuries, either lateral or dorsal, of the anterior part of the anterior corpus quadrigeminum in cats, if deep enough to wound the tegmental roof surrounding the central gray matter, have produced in four cases descending degeneration in Meynert's fountain decussation, most of the fibers decussating at the level of the third nerves to form a longitudinal tract immediately ventral to the opposite posterior longitudinal bundle of the same side. These are the antero-lateral columnar fibers already traced by Boyce into the lower cervical cord. In no case has he produced any degeneration in Forel's lower decussation. (9) In animals with divergent optic axes and periscopic vision and total decussation of the optic nerves there must exist a posterior total decussation of the pupil reflex fibers connecting the anterior quadrigemina with the third nuclei; while in mammals with good binocular vision and semi-decussation of the optic nerves at the chiasma there must be a semi-decussation of the posterior pupil reflex fibers. Consensual reflex contraction of the pupils to light is effected by means of this posterior semi-decussation between the corpora quadrigemina and the third nuclei, and not by means of any commissural fibers between the sphincter pupillæ centers in the third nuclei. (10) The lesion in typical Argyll-Robertson pupil is probably a sclerosis of these fibers, some of the fibers of Meynert's decussation, and simple reflex iridoplegia is not due to a nuclear lesion, though a nuclear lesion may be superadded in the dilated type of Argyll-Robertson pupil, in which the reaction to convergence and accommodation is also lost. JELLIFFE.

NEUROLOGISCHES CENTRALBLATT

(Vol. 23, 1904, No. 1, February 1.)

1. Two New Skin Reflexes of the Lower Extremity. EMIL REDLICH.
2. Contribution to Myokymia. J. MEINERTZ.
3. Amnesic Aphasia. S. POPOFF.

1. *New Skin Reflexes.*—Redlich describes two new skin reflexes, the first is obtained by stroking in the mid-line the posterior part of thigh, the leg being held free and in support. There is a contraction of the biceps, semi-tendinosus and semi-membranosus muscles, and sometimes the abductors. The second reflexes obtained by stroking the mid-line of the calf, the toes and foot will be as a consequence in plantar flexion. The reflex is normal, and is diminished in such organic diseases as hemiplegia.

2. *Myokymia.*—The author describes a case of general myokymia in a patient who had other symptoms of a neurasthenic condition. The different theories of the disease are discussed, and the author comes to the conclusion that, as in his case, they are mostly functional in origin.

3. *Amnesic Aphasia.*—Popoff details an interesting history of a man, thirty-one years old, with right hemiplegia and aphasia. He could only say yes and no, had paragraphia, but he had retention of spontaneous